RURAL INDIA

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"Salvation of India lies in Cottages".

—MAHATMA GANDHI

Twenty-Two Years

"RURAL India" completes 22 years with the publication of this issue for October 1960. Inspite of all stresses and strains, financial and circumstancial, it has incessently served the cause of constructive nation building with increasing zeal and enthusiasm and maintained its high standard. It has been its constant endeavour to place before its readers up-to-date scientific and theoretical knowledge, experience and findings of investigations touching different aspects of village life. It has boldly expressed its views, though at times a little bitter to certain sections; but it has all along kept itself above partisanship and political or any other considerations, always keeping in view the interest of the lowliest and the lost, the toiler in the field, the kisan and the mazdoor on whose strength the nation stands. Our thanks are due to our generous contributor who have been freely sending their enlightening contributions free of any remuneration, to make a common cause with us in the service of the nation. We also thank our readers for their co-operation who, particularly during the last year, had at times to suffer delay and such other inconvenience caused by unavoidable circumstances.

The last 22 years have been most memorable and epoch making in the life of the nation. During this period we witnessed the advent of our long cherished freedom from the shackles of foreign rule followed by two Five Year plans to build and strengthen the national economy. The twenty-second year, while passing through a struggle to maintain the core of the Second Plan for want of adequate financial resources, was chiefly marked for the release of Draft outline of the Third Five Year Plan involving an outlay of Rs. 10,200 crores which is practically double of the Second Plan. It is an irony that not even one week passed after the release of the Plan frame, that the nation witnessed country-wide strike of the Central Government employees. It was a clear indication of the growing dissatisfaction and discontentment among the very employees of the Government who enjoyed far more privilegesand facilities of service than the people in other services.

In spite of the implementation of the two Five Year Plans and the alleged increase in national and per capita incomes and also a target of over 25% further increase in the national income envisaged in the third Five Year Plan, the common man seems to be dissatisfied

to the extent that he is prepared to resort to drastic measures risking even what he possesses. The high figures of outlays and investments, and the increase in national income as a result thereof seem to give no satisfaction to him, as he is not convinced that it would really improve his condition.

As a result of the first Five Year Plan it is stated that the national income went up by 18%. The question was raised in the Parliament to enquire as to how that increased income was spread and which section or sections of people were benefited by it. It is reported that instead of increasing, the average income of the agricultural labourer which was estimated to be Rs. 104 per year has gone down to Rs. 87 after the First Plan. If it is so, it tells the whole story of the dis-satisfaction of the common man. Our Plans aim at narrowing down the disparities of incomes and wealth. But unfortunately the result is otherwise.

We have been focussing the attention of our readers to the increasing volume of unemployment in the country. Although one of the objectives of the Second Plan was to provide increased employment opportunities to the people, yet the fact is that the number of unemployed estimated to be 5.3 million at the close of the First Plan has now gone up to about 10 million when the Second plan is nearing completion. Even in the Third Plan we are not assured of any easing of the situation. The employment opportunities created as a result of the implementation of the plans do not keep pace with the increase in population ; and the net result is constant increase in the number of unemployed.

It is sad commentary on our planning that we cannot plan for full and total employment. As enjoined by the Constitution; it is the responsibility of the Government to ensure work for honourable living to each one of its citizens. But inspite of huge outlays of our plans we fail to ensure even two square meals a day. The National Sample Surveys reveal that apart from total unemployment 2 crore people in the country get work for only one hour or less per day; 2.7 crore for 2 hours or less per day and 4.5 crore for 4 hours or less. Further, as many as 2 crore people have a per capita income of Rs. 38 only per year and 4 crore have about Rs. 78. This is a sad condition. Of what avail is our planning if we cannot bring relief to such of our people. ?

Our planning is done mostly from the top and not from below. Whatever planning is done at the State, district or lower levels is not the planning of or the people. The planning bodies are constituted mostly of the people who owe allegiance to the party in power and their opinions are invariably influenced by political and other considerations rather than the actual needs of the people. It is not the people who make the plan but the plan is made for them. How can the people be enthused to implement such a plan ? It fails to evoke their interest and initiative.

Situated as we are in the midst of poverty, hunger, ignorance, squalor, unemployment, idleness, fast growing population and all sorts of wants, our plan must, of necessity, be employment-centred. *No man must remain without work*. That must be the first condition. We lack capital; we lack other resources. But we have abundance of man power. We must

plan to make full use of that man power which in the absence of proper planning and facilities of work and conditions, largely goes to waste at present.

In our thinking and planning, we seem to give priority only to 'big' projects which involve huge outlays. Small projects receive scant attention. But dispersed as we are in small villages and hamlets spread throughout the length and breadth of the country, our projects to utilise local resources of men and materials, have perforce to be small in nature and size, though when put together, their volume may be sufficiently big. Village or region wise schemes of irrigation and water supply; bunding of fields and dams for preservation of moisture and stoppage of land erosion; construction of suitable ware houses for storage of food grains and other agricultural produce; erection of school and hospital buildings; building of link roads: programmes of education and vocational training; small scale, village and cottage industries schemes; setting up of small workshops for the manufacture of agricultural and industries, tools and implements; and numerous such other schemes affecting village life, which can really benefit the people and utilise their power and resources, need to receive first priority in our planning. The plans should be made by the people and executed by them with the help of the Government.

The Third Plan And The Resources

By: Prof. S. V. Ramayya

ON the eve of the advent of the Third Plan it is necessary to find out the availability of financial resources to enable us to implement the plan of such a magnitude to a successful conclusion. The Draft Third Plan proposes to spend Rs. 11,250 crores on the National Development during the Five year period 1961-66, out of which Rs. 10,200 crores will be actual investment (Rs. 1,050 crores for current outlays like administrative charge). Out of Rs. 11,250 crores the public sector proposes to spend Rs. 7,250 and the private sector is allotted Rs. 4,000 crores.

Before we discuss the problem of finding the resources, it is desirable to summarise the aims of the plan, for, we consider, the aims at basically the deciding factors in creating the required enthusiam and initiative for necessary sacrifices and great efforts on the part of the people. The Plan has broadly five aims namely, (i) to secure a rise in national income of over 5 per cent per annum (over the five year period 25%), (ii) to achieve self-sufficiency in food grains and increase agricultural production to meet the requirements of industry and exports, (iii) to expand basic industries like steel, fuel, power and establish machine-building capacity so that the requirements of further industrialisation can be met within a period of 10 years or so mainly from the country's own resources, (iv) to utilise to the fullest extent possible the man-power resources of the country and to ensure a substantial expansion in employment opportunities and (v) to bring about a reduction of inequalities in income and wealth and a more even distribution of economic power. All these aim at creating

a self-sustaining or self-generating economy, or that economy whose growth becomes automatic. That is, this Plan must create a "Take-off" stage of economic growth where a high proportion of the People's energies, talents and resources are channelled into the nation-building activities. Here growth become self-sustained — "investment rises and remains over 10 per cent sufficient to outstrip population growth and to make an increase in output per capita, a regular condition." (Rostow)

The problem of raising resources is the crucial problem. The Draft mentions the different sources from which resources may be mobilised for the outlay of the public sector namely, Rs. 7,250 crores.

1. Balances from revenues on the basis of existing taxation Rs. 350 crores. It is anticipated that this amount would accrue automatically as the Plan leads to progressive increases in incomes and production.

2. Contribution of the Railways on the existing basis-Rs. 150 crores. This target is also not unattainable. The railways are expected to contribute this amount after meeting their expenditure on laying new lines, etc.

3. Surpluses of other public enterprises on the existing basis — Rs. 440 crores. As we aim at socialist pattern of society the state is increasingly taking a progressive part in running a number of enterprises. The Draft hopes that surpluses from Central Government enterprises like iron & steel, fertilisers, oil extractions, Posts & Telegraphs are estimated at Rs. 300 crores and from the enterprices of State Governments (Electricity boards, State undertakings) at Rs. 140 crores. These estimates represent the balance of resources available after providing for working expenses as well as depreciation. We do not doubt the capacity of public enterprises to provide us Rs. 440 crores over the plan period. To make the public enterprises pay to the development is an easy and painless method of raising resources. But as most of these are monopolies there is always the danger they may not be run efficiently and to secure surpluses and show more profits, the temptation to upgrade the prices of a number of services and goods is there. To cover up the inefficiency, prices may be raised from time to time. The profits made by public enterprises are not always indications of the efficient management. The need for the creation of consumers' councils in such circumstances to protect the interests of the consumers cannot be over-emphasized. We have to guard also against the danger of the government becoming a model employer and spending huge amounts on various amenities, buildings etc. The benefits of these enterprises should also be passed on to the consumers in the shape of lower prices.

4. Loans from the public are placed at Rs. 850 crores. This target is not difficult to achieve now that the prize bonds have been introduced. The previous performance of the governments, both the central and the states, encourages us in our conviction of tapping this source profitably.

5. Small savings are to contribute Rs. 550 crores. We do not consider this amount as difficult to attain-provided we tap the savings in the rural areas and in factories. There we must realise that the amount of contribution from masses would

increase provided they are convinced of the goals of economic freedom. The amount of small-savings forthcoming would depend on stabilising the price levels of essential goods, lest the rise in prices would wipe away their capacity to contribute.

6. Provident Funds, betterment leviels, etc. are expected to contribute Rs. 510 crores. It is absolutely necessary to extend the benefits of provident schemes to almost all the industries, and occupations both in the public and private sectors. The betterment levies are also welcome in the sense that the recipients of definite benefits would have to pay. But the severity of collection can be greatly mitigated by administrative arrangements of spreading over the collection in instalments over a number of years.

7. Additional Taxation including surpluses from public enterprises are put at Rs. 1,650 crores. This is a major item and calls forth great sacrifices from the people. The Planning Commission pins its faith on excise and customs duties whose yield has been increasing year by year. It is argued that taxes on essential commodities would mop up the "spendspree" of the masses and enable us to stabilise prices. The Plan is supposed to generate incomes of the masses and thereby increase the capacity of theirs to spend. Hence indirect taxation would put a check on their increased consumption. We are doubtful how far these propositions are correct. Unfortunately we do not know the way in which the planned economy benefits, are being distributed among different classes of people. To assume that the Plan benefits are accruing to the masses in the form of increased incomes is far-fetched. We are afraid that the beneficient classes are contractors, businessmen and land-owners and the real benefit has not percolated to the masses.

Our experience has been that taxes on commodities have always resulted in great increases in prices, making the burden on the masses heavy. We agree that consumption should be restricted. But we plead that the burden should be borne to a greater proportion by the richer sections of the community. Direct taxation and tapping the evasion of assessable income would be more profitable. Strengthening the administrative machinery of collection and closing the loopholes of evasion would be more conductive to the contribution of more revenue. Similarly we are afraid that the prices of products of public enterprises if raised in order to get surpluses may also raise the prices of various other goods as well. These are some of the dangers that have to be guarded against. Certainly the raising of Rs. 1,650 crores additional revenue is frought with difficulties. These require profound social, psychological and political changes from the attitudes of peasants to those of civil servants and politicians.

8. Now we come to the amount of external assistance necessary to implement the Plan. The Draft mentions a foreign exchange content of Rs. 2,200 crores. We are afraid the foreign exchange deficit would be much larger than the anticipated amount. We have to remember that a number of loans repayable in foreign currencies fall due in the Third Plan period. The Plan actually puts forth external assistance requirements at Rs. 3,200 crores (out of which) about Rs. 450 to 550

crores represent our payments to be made plus Rs. 600 crores loan which we got from U. S. A. for importing 17 million tons of food grains under P. L. 480 Agreement. The Draft puts Rs. 1,900 crores necessary for importing machinery and Rs. 200 crores for importing components, intermediate parts, etc.

It is difficult to prophesy to what extent we would be able to get the needed foreign assistance. To a great extent the difficulty would have been reduced, had we created capacity for exportable surpluses. Unfortunately we are not in a position to diversify and increase our export greatly especially the raw-materials, like jute, tea, coffee, iron ore, oil-seeds, tobacco, hides and skins, spices as these are equally needed for the internal consumption. Unless we increase the production of these greatly, which again requires efficiencies in the agricultural sector, it is difficult to create sufficient exportable surpluses. Mr. Morarji Desai reports that the climate in foreign countries is very favourable for helping India.

We are also pleading that advanced countries should set apart 1% of their national income to help the underdeveloped countries. Mr. Gunnar Myrdal the famous Swedish economist advocates planning on international scale as absolutely necessary for the stability of world economy. Many of the under-developed countries are facing the problem of failing prices for their exportable primary products and rising prices for their importable industrial goods and hence their balance of payments difficulties are becoming more and more acute. Stabilisation of prices of primary products has to be attempted on an international scale so as to afford relief to the under-developed countries who are attempting economic development. It would be desirable that countries channel their aid through the U. N. to avoide the possibilities of economic and political strings being attached. Prof. Rostow also wants that U. S. A. and U. S. S. R. should assist the under-developped areas with large amounts of capital. Unless other prosperous countries like U. K., Japan and Germany equally play a notable part and unless the U. S. A. provides us a major portion of the foreign exchange resources it may not be possible to overcome these difficulties.

There are also signs of hope in getting aid from friendly countries. A number of socialist countries are also prepared to accept rupees payments in lieu of their expports to our country Prof. G. Myrdal stresses the need to close the increasing gap between the under-developed countries and advanced countries so as to mitigate the social and political repercussions on world economy. Economic aid is a need because many countries are in constant danger of not being able to lift themselves out of stagnation. Inspite of the favourable climate we should not be under the impression that foreign aid is forthcoming.

A number of countries have embanked on development plans and these are also aspirants for foreign aid. Hence it is difficult to predict the amount of foreign aid forthcoming. Be that as it may, the amount of foreign exchange resources required by us may be of greater magnitude than anticipated. The prices of industrial goods are increasing which may require a greater amount of foreign resources. We may have

also to import more defence equipment. Hence the amount of foreign resources required by us and anticipated, seems to be hazy.

9. Even then we fall short of financial resources to the tune of Rs. 550 crores in the public sector. This is proposed to be covered by deficit financing. It is still controversial how far the inflationary method of financing economic development can be justified. The first ECAFE Report remarks: "Inflation distorts the distribution of income. It increases the profits of businessmen but causes hardship to all with salaries and other fixed income. Continued and progressive inflation weakness the confidence in the currency and reduces the willingness to save". The Second ECAFE Report opines. "On balance.............. it would seem that inflation as a method of mobilising domestic capital in under-developed areas needs to be viewed with caution and must not be resorted to except within severe limits."

In the context of the above authoritative opinions, it is difficult to assign an important place to deficit financing. Some advocate this method of finance on the plea that the evils of price increases can be countered by rationing, investment, control import etc. But our experience has been any thing but happy. Because of planned development expenditure and deficit financing during the 2nd Plan period, it is admitted that prices had risen by 20 per cent. Further, deficit financing will result in spiral prices. How essential to hold the price line, needs no stress. Any further increase in domestic prices will upset financial allocation and targets and upset the exportable capacity of our country.

There will be less demand for our exports because of their higher prices. The rise in domestic prices will tend to raise new demands for higher pay from organised labour leading to grave social unrest. During the First Plan period, resort to deficit financing, did not raise the price-level, should not blind us to the facts that then there were favourable factors which are absent at the present time. Monetary, budget and debt policies should be conducted in such a ma ner as to promote reasonable stability of the general price-level. Hence we do not advocate even a small dose of deficit-financing.

The above account reveals the difficulties of raising resources, the burdens that have to be borne, and the sacrifices that have to be undergone by the people. Rightly A. H. Hanson remarks: " It demands great determination on the part of the central government........on the part of the politicians who occupy ministeriaal office, it demands considerable self-denial......... They must cease to be prima-donnas, stop empire-building, resist corrupting measures and develop habits of mutual consulation and co-operation.........A political revolution may be able to eliminate the inefficient and corrupt but it cannot perform administrative miracles..The process of eradicating the old, bad habits, of acquiring new political and administrative skills and of creating more rational forms of organisation is bound to be gradual." How true is this under democratic planning! Let us hope in this pilgrimage ahead the same traits of dedication and devotion, sacrifice and suffering will be exhibited without which economic growth cannot be sustained.

Third Five Year Plan And Self Sustained Growth

By : V. Haridasan

Introduction :

TEN years ago, the idea of sustained economic planning over a long period of twenty-five or more years sounded too distant a goal to be reached. But with the launching of the Third Five Year Plan we shall be entering the middle years of this period. The effort of the middle five years can be compared to the few brief moments before an air crafts take off when it mobilises its full engine power in a supreme effort to be air borne.

"Take Off" explained:

The 'take off' view of economic development is associated with the name of Prof. W.W. Rostow, the renowned economic historian of Oxford. His theory of economic development has been discussed recently both in the press and in the academic circle. We may examine his theory in the context of our proposed Third Five Year Plan. Prof. Rostow's theory has been called by the 'Economist' as "one of the most stimulating contributions made to economic and political thought since the War". Primarily an economic historian, Prof. Rostow gathered the material from a comparative study of economic devolopments of great powers. The essence of his theory is that it is broadly possible to tabulate every country as being within one of five stages of growth.

In the first place there are the traditional societies, which have not availed of the boon of modern science. They are marked by stagnation. The stagnation may refer either to the aggregate national income or to per capita income. The former rules out growth altogether and is characterised by zero net investment. The latter will provide a minimum investment that maintains the rate of growth equal to the growth of population.

Secondly there are the transitional societies, which are created once a country is rich enough to devote 5 to 10% of its national income to investment and once a new leading elite has emerged which has the urge to build a modern industrial society. Rostow has found that nationalism rather than the pure profit motive has created that urge in the elite.

Thirdly there is the stage of the "take off" a brief period concentrated usually within a few decades, when the economy becomes more or less automatic and self-sustaining. Countries like Argentina, Turkey, and most important India and China are on the march toward "Take off" now.

It is the fourth stage which has hitherto proved most momentous for the mankind. About sixty years after the take off a country has generally reached, what Prof. Rostow calls the dangerous stage of maturity. Countries like Germany, France, Japan and U.S.S.R. are in this stage of economic development.

The last stage in Rostow's analysis is the stage of high mass consumption.

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Extension Service Home And Abroad

By : Bhupal Singh Rathore

Extension Service Abroad : In several European countries the origin of agricultural extension work dates back over one hundred years. In its initial phases a few foresighted people recognised the possibility of improving agricultural production by teaching farmers in general the better cultural practices adopted by their more successful neighbours. From 1840 onwards, travelling teachers of agriculture were employed in Italy, Norway, Ireland and in a number of other countries to go from farm to farm and demonstrate better methods of ploughing seed selection and husbandry. These were the fore-runners of the modern extension work. Although farmers' Associations in many countries employed technical advisors to assist their members in solving their agricultural problems in the 19th century, it was not untill after 1900 that comprehensive extension services were established in most of the Eastern countries. It was due to a recognition of the economic need to bring scientific advances in agriculture into farm practice. This marked the change from the prescientific to scientific age in the field of Agriculture and rural welfare.

At present in most of the eastern countries there are organised Agricultural Extension Services, though they differ greatly in organisation, scope, personnel, administration and efficiency. The present organisation in each country has been influenced largely by its historical background and the social and economic conditions of the people. But broadly the existing Extension services may be classified as follows :-

(I) Farmers themselves formed local associations for the purpose of improving their agricultural methods and hiring advisers to assist in bringing them the latest scientific knowledge.

(ii) Extension work developed as an extension of teaching of Agriculture in school, college and University.

(iii) Governments established agricultural extension services through their ministries of Agriculture and Local Government authorities.

(iv) Research workers conducted extension activities among farmers in an effort to put the results of scientific agricultural research into practice. A great many research workers and research institutions still conduct this type of extension activity both with and without the help of regular extension worker.

The above classification shows two contrasting systems of organisation; those directed and administered by Governments and those directed and administered by farm organisations and associations. Examples of the purely Governmental type of organisation are to be found in the United Kingdom and Netherland, while the second type of organisation has been most fully developed in Denmark. There are moreover intermediate variations between the

types and in no two countries are the organisations exactly comparable.

Extension Service in Denmark: Denmark is a low lying country. The total agricultural area (1954) was nearly 7.5 million acres divided into two lakh holdings. 20 percent of the holdings were under 12.5 acres, 25 percent between 12.5 and 25 acres, 40 percent between 25 and 75 acres and the rest above 75 acres. About 28 percent of the population live exclusively on agriculture. The agricultural area has shown a decline since 1938, the net decline by 1954 being nearly 5 lakh acres. Inspite of this agricultural yields have increased.

The Danish genius for organisation has found expression in a very well developed co-operative system. Almost every farmer is a member of one or more co-operative socities. It has been estimated that about 36% of the fertilizer requirements and 52% of the feeding stuffs are procured through such socities. The co-operative movement operates in numerous fields and it has done a great deal to provide the Danish farmer with his requirements at reasonable prices and to enable him to secure the most-favourable prices for his produce.

At present in Danish Extension work is not organised by the State but by the organisations of the farmers. Previously at the beginning of this century there were 67 officers in the Extension or Advisory Service, 49 of whom were employed by the Agricultural Societies and 18 by the State. From 1901 onward the small holders' associations which were rapidly gaining strength began to appoint advisors for their own members. The existing extension services are now operated mainly by two parallel but independent groups of socities. The first group comprises agricultural societies with about 1,40,000 members and the second group 1,360 small holders' Associations with about 1,14,5C0 members. These socities are self-governed and receive Government grants for their extension or advisory services. Each of these groups is affiliated to a provincial federation. The provincial federations. provide two delegates from the two national federations. There were nearly 600 advisors in 1950, out of whom only 11 were employees of the State Government.

Extension Service in the United Kingdom: About 80 percent of the land area of the United kingdom is used for agriculture – 48 of the 60 million acres and about 5 percent approximately, 1½ millions of Britain's working population are engaged in it. It is estimated that there are about 50,000 part-time or hobby farmers. Besides, there are nearly 7,00,000 farm workers. Excluding rough grazing and holdings consisting solely of mountain, there were in 1956 just over 3,50,000 farms and holdings with over 5 acres of crops and grass, besides about 90,000 agricultural holdings of 5 acres or less. About 25 percent of the holdings were 100 acres and over accounting for nearly 70 percent of the agricultural area, 15 percent were 50 to 100 acres and about 40 percent wers 5 to 50 acres. The average size of the holding was 68 acres in England and Wales and 61 acres in Scotland. The gross value of the agricultral output increased from about 400 milliom pounds in 1940-41 to 1,340 million pounds in 1955-56. About 70 percent of this is derived from livestock and livestock products.

The British Farmers who had achieved a high level of craftmanship even before

the impact of science have been able to strive for still higher levels of productive efficiency, thanks to the well organised agricultural Advisory Service. The extension service, has on one flank the Research Centre and on the other the Agricultural Education Service of the local authorities.

The National Agricultural Advisory Service was inaugurated in October 1946. Previous to this organisation the extension work was carried out by the county council, the universities, the Research Institutes and the Ministry of Agriculture. The *N.A.A.S* as now organised, is the responsibility of the Ministry of the Agriculture only. It serves all farmers. For administrative purposes the country is divided into eight N. A. A. S. provinces. Each province is under the charge of a Provincial Director who is responsible for the extension service. The Provincial Centre has a large staff of specialists divided into groups of science and husbandry specialists. In addition there is an advisory aids officer. The specialists at the provincial level deal with the more difficult questions refered to them by the specialists at the county level and the advisors in the field. They also carry on experimental work and assess general advisors to keep abreast of new developments in their special subjects. The advisory staff at the county level consists of a number of specialists depending upon the local agricultural conditions. The specialists support and assess the district advisory officers in their field work. These district officers are responsible for the field advisory work in their respective districts which comprise 800 to 1,000 farm. They deal with all the general agriculture problems.

Extension Service in U. S. A.

The United States uses four–fifths of the land area within its continental limits for agriculture and there are about 54,25,000 farms. The total tillable land area is about 509 million acres and the average size of farm is 215 acres. About one fourth of the land in the country is cropland and more than half is permanent pasture and grazing land. In 1954, 2,18,90,000 people lived on American farms nearly 13 percent of the total population. Actual farm workers number about 87,20,000.

In the early days the principal aim of extension work in United States was to assist farmers in solving technical problems connected with agriculture and to provide advice to farm women on home making problems. With the passage of time the concept of extension has broadened and the co–operative extension was established by passing the Smith Lever Act of 1940. It is a co–operative organisation governed by the United States Department of Agriculture, the State Land Grant Colleges and the local county authorities.

The President of a Land Grant College is responsible to his Board of Regents and the United States Department of Agriculture for the conduct of Extension. The appropriations to the College are provided through the State Legislature and the Federal Department of Agriculture. In every State there is State Director of Extension, who is responsible for general conduct of extension, work in the State. The State Director may be responsible either to the Dean of Agriculture or to the President of the College according to the organisation of the Land Grant College.

The service works closely with the

major farm organisation, i. e. the farm Bureau, the National Grange and the farmers Union. This co-operation, however, is on a purely voluntary basis, with the exception of six or seven States in which the farm Bureau and Extension service are associated by Law.

The United States Extension Service reached 10.3 million families in 1957 with its instructional and practical aid to home makers. This service is composed of about 14,000 professional working leaders who in turn consists of country agricultural agents, home agents, 4-H club leaders and others. In the year ending June 30, 1954 the United States gave other countries a total of 183.9 million pounds of surplus food. Food production in the United States has increased by about 50 percent since World War I. Extension and Research Scientists and demonstrators have been the major means of United States Agricultural Development.

Origin and Development of Extension Service in India :- The concept of rural development is not new in India. But in the past there was no planned development either for the cities or for the rural areas. The first efforts in this direction were made by Mr. F. L. Brayne. He started an experiment of rural development work on a fairly extensive scale in Gurgaon district where he was posted as Dy. Commissioner in 1928. He overcame the difficulty of Finance by utilising the District Board funds for the purposes of his programme. A considerable enthusiasm was created and many improved practices were introduced in the villages of Gurgaon. However, the weakness of the programme lay in the fact that the initiative came entirely from the top, and people's active participation was not secured. As a result, most of the work came to a stand-still after the transfer of Mr. Brayane from Gurgaon. However, his achievement lies in the fact that he brought the village problem into prominence and set people thinking.

On the people's side it was tried out by workers associated with Mahatma Gandhi and by Tagore through rural reconstruction programmes. In Baroda, as also in Madras, it was worked out in some form or other. Later, various experiments were made in the pilot projects at Etawah, Gorakhpur and Nilokheri. But these were sporadic efforts and had obvious limitations. Out of the pooled experience gained through these experiments came the Community Development Programme as an integral part of the Five Year Plans. The programme was initiated on October 2, 1952, with the launching of 55 Community Project Blocks, each covering about 300 villages, with an area of 450 to 500 sq. miles, a population of about two lakhs and a cultivated area of about 1,50,000 acres. The project area was divided into three development blocks.

The experience of first community projects and the popular enthusiasm that they aroused emphasised the need for a rapid extension of the programme to other parts of the country. But the country's resources were not enough to sustain a comprehensive programme of the same magnitude, as contemplated in the first 55 community project blocks. The Government, therefore, decided to launch, along side the community development projects a programme which was somewhat less intensive in character called the National Extension Service. These two programmes were complementry. Thus the community development was being carried

out till recently in three phases – N. E. S., C. D. and post intensive. The N. E. S. stage normally ran for three years during which a limited programme of development was executed with a ceiling of Rs. 4,00,000. This was followed by another three years of intensive development with the full complements of staff and a budget provision of Rs. 8,00,000. Thereafter, the Block entered the post intensive stage when only Rs. 30,000 was available for expenditure annually.

In November 1957, a team led by Shri Balwant Rai Mehta was appointed by the Committee on Plan Projects to study the working of the community development programme. As a result, the programme has undergone a number of important changes. It has now been decided that development activities in rural areas must be intensive, continuous and of substantial duration so that the urge among the masses for better and richer life may be met adequately and the economic level of the villagers raised. To attain such a sustained and accelerated tempo of development, the programme has been implemented in two stages of five years each, instead of three phases.

As regards financial allotment, having regard to past experience of the rate of expenditure, it is felt that a provision of Rs. 12,00,000 will be made for a period of five years in second stage. It has also been decided that in view of renewed emphasis on agricultural production, such blocks as inaugurated from 1st April, 1959 will have a one year period of pre-extension activities exclusively in the field of agriculture.

Organisation : The Ministry of Community Development established in September 1956 has the overall charge of the programme. Matters of basic policy are placed before the Central Committee, consisting of members of the Planning Commission and Ministers of Food and Agriculture and Community Development, with the Prime Minister as Chairman.

The actual execution of the Development Programme is the responsibility of the State Government. The sole authority responsible for the implementation of the Development Programme in the State is the State Development Committee, consisting of the Chief Minister as the Chairman, the Minister of the Deveiopment Department as Member and the Development Commissioner as Secretary.

The Collector is the Chairman of the District Planning or Development Committee. All the Heads of the Development Departments in the District are represented on the Committee which also includes the Chairman and Vice Chairman of the District Board as well as many other non-officicials.

At the block level, the Block Development Officer is assisted by a team of experts in agriculture, co-operation, and Animal Husbandry, Cottage Industries etc., in development work. Finally, there is the V. L. W. who acts as a multipurpose extension agent and is incharge of about 10 villages. While this remains the general pattern of organisation, minor adjustments to suit local conditions have been made in the States to ensure efficient and smooth working.

Along the official set up, non-official participation has been secured in the implementation of the community development programme. At the Centre, Parliament provides guidance and direction. In the State, this function is performed by the

State Legislature. At other levels also it is realised that, for the programme to become a people's programme, it is essential that the power of taking decision regarding the planning and implementation of development programme should be vested in the people. Block Advisory Committees now to be known as Block Development Committees are taking such decisions. The Block Development Committees are to help in the planning of the programme for the Block through village panchayats and other village institutions.

But to give a sound basis to programme for enlisting people's active support, the Balwantrai Mehta Committee has recommended what is called "Democratic decentralisation." It envisaged at the Block level the establishment of the statutory bodies consisting of representatives of the people. Such a body to be called the Block Panchayat Committee would be incharge of the total development programme in the Block. The extension staff at the Block would also be at the disposal of the Panchayat Samiti. At the District level, a people's body called the "Zila Parishad" will have powers of general supervision, guidance and co-ordination.

Progress Of Community Development

As against an allocation of Rs. 91.3 crores under the First Plan, a sum of Rs. 200 crores was earmarked for community development and National Extension Service programmes in the Second Plan. The target during the First Five Year Plan was the coverage of a fourth of the rural population in 1,200 blocks–700 under the community programme and 500 under the Extension Service – comprising 1,20,000 villages. This was achieved.

While drawing up the Second Five Year Plan, it was envisaged that the whole work of the country would be covered by N.E.S. Blocks by 1960-61, of which 40 percent would be community development blocks. However, with the revision in the programme the complete coverage will now be achieved by October 1963 instead of April 1961. The number of Blocks at present in operation are as follows :-

Stage I Block.	Total
(a) Community Development blocks converted before 1-4-1958	399
(b) Special Multipurpose Blocks	43
(c) Old N. E. S. Blocks which were in operation on 1-4-1957	1,493
(d) Block inaugurated in April 1959 with pre-extension period of one year	150
Stage II Blocks :	
Old post intensive blocks	426
Total	2,511

So far 2.99 lakh villages with a population of 16.1 crores have been coverd under the community development programme. In other words, more than half the rural population and total number of villages in the country have already come within the ambit of the movement.

Study Of Rural Credit Activities In Co-Operative Integrated Project-Nauranga*

By : Dr. J. S. Garg, & K. M. Varshney

PLANNING Research and Action Institute Lucknow, U. P. jointly with the U.P. Co-operative Department undertook a Co-operative Integrated Project, Nauranga as a pilot Project in 1955, to test out the efficiency of integrated pattern of Co-operative Society recommended by the All India Rural Credit Survey Report, 1954.

Objectives:-

Its main objectives were:

1. To organize a larger primary society by amalgamating the existing societies with a view to deal with credit, consumers and farm supplies and other services required by its members.

2. To organize simultaneously a Marketing Society with Potential marketing facilities.

3. To co-ordinate the credit activities of the Large Primary Society with those of the Marketing Society.

4. To test out the system of advancing loans on crop basis.

5. To test out the efficiency of the Society with the state partnership.

6. To assess the advantages of paid staff and management.

Method Of Approach :

Out of 42 villages in the Project area 6 villages were purposively selected. The most important criteria in the selection of the villages was the easy approach with better transport facilities throughout the year. Villages were selected within the radious of 3 miles from the head quarter (Nauranga Mandi). 130 farmers belonging to the different sizes of holding varying from below five acres, five to ten acres and above ten acres were studied. Correct and regular supply of information by the culivators throughout the investigation were the main consideration of the selection. Primary data were collected by personal interview of the author on the questionnaire prepared and approved by the section of Agricultural Economics, Government Agricultural College, Kanpur.

Discussions :

There are numbers of conclusions in the present investigation but at present, this paper is confined only to the credit activities of the Project.

TABLE NO. I

Showing Loan Requirements and the advances thereof for production, during the year 1956-57

Size group	Loan Demanded	% of loan advanced by the Society	% of loan advanced by village Mahajan	% Total	% of requirement remained unfulfilled.
below 5 acres	Rs. 4,100	34.17	33.05	67.22	32.78
5-10 acres	7,870	47.82	31.63	79.45	20 54
above 10 acres	6,861	39.63	31 24	73.87	28.96
Average	Rs. 144.85	40.54	31 64	72.18	27.43

* The work was submitted for the partial fulfillment of M. Sc. (Ag) degree in Agricultural Economics by the junior author in 1958 under the guidance of the senior author.

From the above table it can be concluded that on an average, the co-operative Society met the loan demand of cultivators to the extent of 40.54 % only. Out of the remaining 59.46%, 31.64% was met by village Mahajans, and 27.43% remained unfulfilled. Another conclusion which can be drawn from the same table is that the farmers of 5-10 acres holdings get highest benefit and their demands were fulfilled to the tune of 47.82%, while the farmers of lower category (below 5 acres) got loan advances to the extent of 34.17% only. Low cash credit limit and low capacity of crop loan to the farmers of lower holdings were responsible for above conclusion as the loan demands in those cases were always higher than the cash credit limit and the crop loan advances.

The village Mahajan is one of the other sources for meeting the loan requirements of the farmers, who inspite of loan advances from the society met their loan demand to the extent of 1/3 of their requirement. As such both the Society and Mahajan were able to meet, on average 72% of the loan requirements of the cultivators. 28% loan demands remained untouched. Such untouched requirements vary from 20.54% to 32.78% in 5-10 acres and below 5 acres holdings respectively.

The crop loan was one of the important basis on which the loan limit was determined. The cost of cultivation per acre determind the crop loan limit. It is important to point out that the cost of cultivation determined by the society was quite low as could be clear from the table no. 2 in which the cultivation expenses per acre of crop and that the amount of crop loan advanced by the society are tabulated. The result is that the cultivator is not in a position to get sufficient supply of crop loan which fundamently aimed at increasing crop production and he is forced to borrow from the village Mahajan or his loan requirement remains unfulfilled which have an adverse impact on crop production.

TABLE No. 2

Showing differnces between actual cost of cultivation per acre and crop loan advanced by the society in 1956-57.

Crops	Actual cost of cultivation per acre Rs.	Crop loan supplied by the society Rs.	% of crop loan supplied by the society.
Paddy	117.20	45.00	37.60
Jowar	40.00	15.00	37.50
Wheat	191.50	85.00	44.50
Barley	119.00	45.00	37.81
Lahi	19.75	15.00	75.90
Pea	81.75	40.00	48.92
Gram	71.00	24.00	33.78
Sugarcane	298.00	175.00	58.72

The table no.2 shows the actual cost of cultivation and the crop loan per acre supplied to the farmers by the society. In none of the cases the Society provided crop loan upto the requirement of the crop. In certain cases, for instance in gram the crop loan limit is Rs. 24.00 per acre only where as the actual cost of cultivation is Rs.71.00. As such the Society met the requirement of the crop to the extent of 33% only. In other crops eg. Paddy, Jowar, Wheat, Barley, Lahi, Pea and Sugarcane the society met the requirement of the crop to the extent of 37.00, 37.50, 44 50, 37.81, 75.90, 48.92 and 58.72% respectively. The crop loan

supplied by the society has been estimated excluding labour charges considering that the labour utilized in crop production will be mostly family labour. Apparently it sounds well that the farmer should be provided loan for such items in cultivation which require cost expenditure. In this connection it will be very interesting to note that the crop loan in most of the cases was utilized for consumption purposes as production was considered secondary and consumption primary. In case cost of labour would have been included in the estimation of cost of cultivation by the society, the surplus money after comsumption would have been utilized for the purpose of production. Such limited supply of crop loan estimated excluding labour charges moved the very prospects of higher production. Therefore, it is suggested that while estimating the limit loan of a farmer, his consumption as well as production requirements should be rightly estimated. Otherwise loan supplied for production will be channeled in consumptive purposes.

A study was also conducted to find out the weak and strong points of the credit activities as to whether members prefered to take loan from the society and if not what are the causes of their non-preference. The study was conducted under three headings;

(i) Procedural difficulties in getting the loan.

(ii) Supply of credit when the purpose is over.

(iii) Procedural difficulties in repayment of loan.

TABLE No. 3

Showing the causes why loan from the society is not prefered

Size group	Percentage of people not prefered loan due to		
	Precedural difficulties in getting the loan	Procedural difficulties in repayment	Supply of loan after purpose is over.
Below 5 acres	80.00	85.55	22.85
5-10 acres	76.36	70.90	7.27
Above 10 acres	85.00	42.50	2.50
Average	80.45	66.32	10.87

On an average about 80% do not prefer to take loan from the society because of the procedural difficulties in getting loans while 66% on account of procedural difficulties in the repayment of loan.

There were only about 11% who do not prefer it because of the supply of loan after the purpose is over.

Conclusions :

Inspite of the fact that co-operative society wants to meet all the loan demand of the members yet the supply is so limited that the farmer has to go to borrow from village Mahajan which might be because of either the procedural difficulties in getting loan or its repayment. The cash credit limit on the basis of his credit worthiness is also responsible for this action.

The limited loan given to the farmer for the purpose of production known as

crop loan is also very low. Whatever little amount he gets from the society, he does not make its full use in crop production. He utilises loan for consumption purposes also.

On average 72% of loan demand are met either by the society or village Mahajan. Remaing 28% remains unfulfilled.

It is therefore suggested that the loan limit should be increased by the society and the loan should not only be given for the purpose of production but for consumption as well, so that his full demand may be satisfied and he may not have to borrow from village Mahajan.

Procedural difficulties can be overcome with a little thought. It is gratifying to note that about 90% of the farmers get loan at proper time and there was no trouble on that account. As the study has been conducted for one year oniy and the size of sample was not very large the conclusions are simply indicative and can not be treated as final for policy making.

Land Reforms And The Third Plan

By : Prof. R. G. Sony

THE problem of land reforms has engaged the attention of mankind from very early times. However, as the land was abundant in early times, the pressure of population on land was comparatively small. With the growth of population, more and more land was brought under the plough. Due to the limited supply of land, the problem of land reforms has assumed great importance in the modern times.

Secondly, land is the earliest form of the private property accumulated. Tiller of the soil regards land not only as a means of production, but something sacred that should be possessed for the sake of inner satisfaction.

Thirdly, land is also the largest source of employment for the population of the world. Barring a few countries in the world, majority of the population in every country gets living from Agriculture.

Needless to say, India is a country of villages. Our economy is based on agricultural production. The problems of agriculture are too many. The problems of land tenures and absentee landlordism, soil erosin, fragmentation of holdings, etc., require our attention.

Looking back at what has been done in the sphere of land reforms, one will find that several changes have already been introduced all over the country. According to the draft outline of the Third Plan, the programme of land reform has two related objects. The first is to remove impediments to agricultural production and create conditions for high levels of efficiency and productivity in agriculture. The second is to eliminate all elements of exploitation and social injustice and provide security to the tiller of the soil.

In most States, legislation for the abolition of intermediaries (Zamindaris, Jagirs, etc.) has been enacted and implemented. It is well to remember here that abolition of intermediaries is only the first milestone in the history of land reforms. In other words, abolition of intermediaries meant only the elimination of an evil–but this has definitely set the ball rolling and the planning commission has already formulated a

comprehensive scheme in this connection.

Legislation for regulation of rents has also been adopted in most of the states. Maximum rent is fixed in these States. This is certainly a fair deal from the tenants' point of view. Legislation providing for comprehensive measures for security of tenure has been also enacted in many States. Action has also been taken in several States to protect the tenants against the so-called voluntary surrender of land by the tenant to the Landlord.

Legislation for putting a ceiling on future acquisition of land has been enacted in almost all the States. Big land owners holding land in excess of the ceiling are required to surrender the surplus to the Government which, therefore, would be available for distribution amongst the landless labourers and others.

Special attention is being given to the question of improving the lot of landless labour. Shri Jagjiwan Ram, Central Minister has also emphasised the importance of land reforms to solve the problem of rural unemployment. Large scale mechanised farming is not desirable in India. We must evolve such method by which greater use of manpower is to be made.

From the above review it will be seen that some progress has definitely been made in eliminating social injustice and exploitation and in providing security to the tiller of the land. It is expected by the Planning Commission that disparities in the ownership of the land will be reduced and tiller will be the real owner of the soil by the above measure.

It is significant that despite the quick pace with which the land reforms have been implemented in our country, the basic weakness of Indian agriculture, low yield per acre still continues and hence the need of the hour is consolidation of gains made so far. The basic objective of the Third Plan stepping up agricultural production must be attained. It is essential that such conditions should be created by which this aim will be fulfilled, Shri Rajan. Editor, "Commerce" weekly remarks :

"I have in mind the move to place a ceiling on land holdings and to distribute the excess land by paying a token compensation which virtually amounts to expropriation. This is a very controversial reform. It is a reform inspired by ideological considerations and political expediency. It is being imposed from the top and not demanded by the people at the bottom. All the available data on land holdings by individuals show that the number of big landlords is small and that the area of land held by them is not so large as to make any significant impression on the broad pattern of land distribution." It is clear from this, that we cannot hope to gain much from this sort of reform. It is absolutely necessary that we are to raise output of foodgrains from the present level of 75 million tons annually to the Third Plan target of about 105 million tons. Our farmers should adopt the modern techniques to raise the output per acre.

The Planning Commission's programme of land reforms is full of idealism and if fully implemented will go a long way towards the fulfilment of the ideal of land to the tiller of the soil and will help the rural areas to approach the ideal of the socialist pattern of society. But practical difficulties are too many. According to Mr. C Rajgopala Chari, our revered leader--"Incentive is the main element and what is being done

to bring into being the 'Socialist pattern' has unfortunately concentrated on agriculture to its detriment." The traditional backwardness of the Indian Cultivator is to be removed. The real backbone of democracy in India lives in villages. In many cases half-way measures have been undertaken to keep the peasantry and the intermediaries satisfied at the same time.

A noted Economist, rather sceptically remarks: "The problem of land reforms has received a weak treatment in the Third Plan. Probably, the Planning Commission is reconciling itself to the realities". Needless to say, if we can make two ears of corn grow where one grew before, we will definitely attain self-sufficiency in foodgrains. The cultivators must also realise that they owe a duty to the nation as a whole.

Farm Planning And Labour Requirement

By : Dr. S. P. Dhondyal

INDIA is passing through a planning phase and the agricultural production programme is receiving a high priority in resource allocation to maximise the earning capacity of the cultivators through the Community Development Programmes. The Directorate of Economics and Statistics, Ministry of Food and Agriculture, Government of India has initiated schemes relating to Farm Planning Demonstration Projects as viable media for effecting improvement in farm organization and operations to raise the farm income levels of the cultivators. Some of the agricultural institutions of the country have already started farm planning projects in the surrounding villages (1) to show the effectiveness of the programme and (2) to serve as a means of making the efforts of the extension workers go further in the direction of increased food production.

Before starting the farm planning projects, agricultural economics departments of agricultural institutions prepare alternative farm plans to show which combination of resources available with a cultivator would yield maximum net profit on the holding by using budgeting method or linear programming technique. In the absence of adequate and reliable data in farm economics in India, the former method is the only tool which can be used with a good deal of success.

In preparing the alternative plans for a farm, the farm economist should not lose sight of the physical aspects of labour needs which may prove a limiting factor to the successful execution of the plan. No doubt, the agricultural labour in the country is unemployed and under-employed for a considerable period of the year; but it has been found that during the seasonal labour peaks the demand for labour falls short of supply resulting in the delay of farm operations. Any delay in the timely operations of sowing and harvesting results in reduced yields.

A farm plan should, therefore, be related to the availability of labour particularly during the peak period. For example, a

NOTE: The author offers his thanks to Dr. W. D. Buddemeier, Agri. Economics Adviser, Govt. Agriculture College, Kanpur and Group Leader (T.C.M.) for going through the articles and making suggestions for its improvement.

farm plan may call for the introduction of a new crop or rotation which fits into the the farming pattern in so far as soil and capital requirements are concerned. But the timings of the planting and harvesting of the crop are such that they clash with the labour peaks of the existing cropping scheme and the hired labour is not readily available or if available its cost is proving a limiting factor to profit maximization. To prove workable, the plan will have to be suitably modified consistent with the availability of family labour. Further, the labour needs of the farm plan are also to be considered in relation to the livestock maintained on the farm. With the provision of more irrigation facilities and cheap credit, a farm economist may suggest a cultivator to keep few high yieiding milch cattle in place of the large unproductive herd to increase his farm income. This would lead to the consideration of making provision of green fodder during the summer months. Early maize sown for fodder in April-May has been found to be a suitable fodder crop in most of the dairy farms. But from the standpoint of labour requirement, tillage operations and lift irrigation for its sowing may clash with the harvesting and threshing peaks of the rabi crops. As such, an alternative has to be designed for replacing it by another fodder crop with more even labour demand. Elephant or napier grass may prove a good choice in humid regions. It is a high yielding perennial grass and 5 cuttings can be taken a year under good management.

For calculating the labour balance of a farm plan, the farm economist should ascertain the labour force available with the farm family. He should then calculate the average labour requirement for the holding and also for each crop and the livestock maintained on it in terms of man hours or man days; the former term is preferable because of variations in the length of a working day. It is better to convert women and children units into adult units on the basis of three women labour units equal to two male adult units and two-child-labour units equal to one male adult unit.

Case-Study Farm (1957-58)

Village Beri-Akbarpur, Kanpur

Size of holding: 4.74 acres.

Soil : Loam.

Source of irrigation: Canal.

Croppnig Scheme		Live Stock		Family members	
0.85 acre	Chari-gram	Bullock	1	Adults	2
1.86 ,,	Fallow-wheat	Cows	2	Children	3
0.95 ,,	Maize-potato	calf	1		
1.08 ,,	Jowar-arhar				
4.74					

Intensity of cropping : 138%

With the facility of school education now made available to the village childlren and the cultivator's wife ramaning engaged in household work for about half of the day, the labour force provided by the family was worked out as equivalant to two male adult units. Assuming the two adults units to work on holding for 300 days annually for 8 hours daily, the following man hours were available :-

Per year	4,800 hours.
Per month	400 hours,

The following statement gives an account of the labour hour units actually spent on the holding :—

Seasonal Distribution Of Labour Hours On The Holding (1957-58)

Crop in acres	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Total
0.85 Chari		42		80									122
,, Gram					58						56	45	159
1.86 Wheat	80	16	16	32	96		96	16	16		104	60	532
0.95 Maize		160	80	144	48								432
,, Potato					330	85	90	88	36	144			773
1.08 Jowar & arhar		130	56		152					52	144		534
TOTAL	80	348	152	256	684	85	186	104	52	196	304	105	2,552
Livestock	130	110	120	120	90	120	130	130	130	120	110	130	1,440
Overhead		25			40						30	10	105
Grand total	210	483	272	376	814	205	316	234	182	316	444	245	4,097

From the above table it will be seen that the demand of labour for the months of April, July and October on the holding exceeded the normal supply of the farm family labour. To cope with the situation, the cultivator worked longer hours during the peak seasons and employed hired labour to finish the job in time. Since it is a one bullock holding the cultivator by mutual adjustment with his neighbour, who was also a one bullock holder, made up one pair to cultivate their respective fields.

Information relating to income and expenditure on holding was also obtained and the results are sumarised as below .

Crop And Live-Stock Enterprise

Size of the holding	Total receipts	Total Exp.	Net income	Family labour income	Family business income
4.74 acres	23,60.75	1,910.25	450.50	850.50	912.49
Per acre	498.05	403.01	95.01	179.43	192.49

The net income per acre was worked out at Rs. 95.01 per acre and the family labour income was Rs. 179.43 which suggests that the family labour could comfortably do all the task on the holding supplemented, of course, by some hired labour which accounted for about 9% of the total labour requirement. The farm business income which stood at Rs. 192.49 per acre illustrates that the cultivator, though a poor

capitalist, could carry through his farm plan on a holding of this size.

Discussion

The results of the investigations as given above are not meant to prove or disprove the soundness of the farm plan and the merits of labour utilization on the farm. But an attempt has been made to show how a cultivator adjusts his crops and live-stock programme to that of the capital and labour available with him. With the introduction of farm planning on a wider scale under the initiative and guidance of the Directorate of Economics and Statistics, Government of India and the provision of greater resource facilities in the form of fertilizers, irrigation water and cheap credit under the National Extension Programme, the farming pattern is bound to change for increasing the earning capacity of our farmers. The farm economist, while suggesting alternative plans for a farm, may also concern himself with the labour aspect of the plan and should not leave it to the farmer to relate it to that available with his family. The plan should not put undue burden on the seasonal labour peaks, otherwise the hired labour input may prove a heavy cost item to its successful execution and might invite unplesant criticisms of the planning activities. The merits of alternative plans should be tested by preparing comparative budgets for each holding and every help given to the cultivators to make their own decisions.

Role Of Superphosphate In Plant And Animal Nutrition

By : A. K. B. Cazi

Nutrients in Superphosphate–

I. Superphosphate which is a well known chemical fertiliser consists of a mixture of calcium phosphate and calcium sulphate. Calcium phosphate in superphosphate is mostly in the form of monocalcium phosphate the phosphoric acid of which is most readily available for plant use. Superphosphate contains three most important plant nutrients viz., calcium, phosphorus and sulphur. These are also the most important nutrients for such slowly life as soil micro-organisms as well as for such highly organised life as vertebrates e. g. birds, cattle, horses, human beings etc. In fact, metabolism or life processes are sustained and controlled in various ways more particularly by the twin elements, calcium and phosphorus than any other minerals. Plants and soil organisms cannot grow or thrive satlsfactorily if soils are inadequately supplied with these minerals. Ninetyfive per cent of minerals constituting the body frame work of vertebrates is made up of calcium phosphate. Human body contains something like 15 minerals. The three minerals which are the constituents of superphosphate viz : calcium, phosphorus and sulphur make up four-fifths, and the twin minerals

calcium and phosphorus both together make up two-thirds of the total mineral contents of human body. The contents of these minerals especially the calcium and phosphorus in food and fodder influence the quantity of milk a cow will yield in a lactation period. Milk occupies the topmost position among those foods which are high ranking in calcium and phosphorus content; and not less than 50 per cent milk ash (minerals) is composed of calcium and phosphorus. In fact, calcium and phosphorus contents of food and fodder generally act as limiting factors in the production of milk.

Influence of calcium and phosphorus on the growth and activities of soil organisms.

2. It is mostly under the stimulating influence of available calcium and phosphorus that the number of nitrifying bacteria — that is, bacteria that fix atmospheric nitrogen — increase rapidly and convert the atmospheric nitrogen into protein of their cellplasm which is the physical basis of life, and whence it is released when these bacterias die and decompose for ultimate use of the plants. These free living nitrifying bacteria of the soil derive their energy from the organic matter present in the soil. In addition to the fixation of nitrogen by free-living soil bacteria, some specific becteria that exist in symbiotic relation mostly with leguminous plants also add to the store of assimilable nitrogen in the soil. These bacteria too thrive and become more active and mobile under the influence of calcium phosphate. Dhar. N. R. observed that 215 lbs. of nitrogen was fixed per acre per annum by nitrifying bacteria under the influence of phosphates when the latter are intimately associated with organic matter, Similar observations were made by Karaker working in U. S. A. who obtained 230 lbs. of fixed nitrogen per acre per annum when phosphates were added to compost.

How calcium and phosphorus improve the nutritional qualities of the crops—

3. As shown by Huges and Evans, plentiful addition of assimilable nitrogen tends to raise the percentage of proteins and other nitrogenous substances of non-protein nature in plants. Thus application of superphosphate as a fertiliser which helps in building up nitrogen level of the soil as stated above also helps raise the percentage of protein in the crops.

It is a general experience that the same variety of a crop, may even coming from the same stock of seeds when grown on different soils produces a crop which differs in one or more qualities such as aroma, flavour etc., or in mineral content and consequently in nutritional values. Application of superphosphate generally results in an increase in the plants' content of calcium and phosphorus. This has been demonstrated experimentally by Bonnet and Raira and other research workers. Sprengel states;

"Red clover for example which has grown upon a marly soil, always contains more calcium, phoshorus and sulphur than red clover which has grown upon a loamy soil since the latter as a rule does not make available to red clover as much calcium, phosphorus, and sulphur as the marly soil. If we consider next that calcium, phosphorus and sulphur are most essential for the growth of the animal body, it is perfectly evident, as repeated experiments

on a large scale have proved, why clover from a marly soil is more nutritious than clover from a loamy soil."

The forage of lush pasture is richer not only in minerals but also in vitamins such as provitamin A and D. These vitamins are necessary for aiding assimilation of calcium and phosphorus in animal system; and there exists a close relationship between the mineral content of a natural food stuff and its contents of specific vitamins that aid the assimilation of those minerals. Thus the factors that contribute towards increase of milk yield are also those that increase the nutritional qualities of crops in respect of vitamins. In fact during the course of plant growth and development there exists a good positive co-relation between the uptake of calcium phosphate and uptake of nitrogen as also the existence of close asssociation of these ingredients with vitamin contents. These three classes of food constituents together form a well knit trio that raises the nutritional level of the food stuff containing them. Such a food stuff is classed as protective food since its consumption safeguards the consumers against the ill effects of malnutrition.

Relation of superphosphate as a fertiliser with yield and quality of a crop.

4. The following experimental data of recent discovery shows how high and perfect relationship exists between the increase in yield of a crop and its nutritional qualities when fertilised by superphosphate or even fertilised separately by its component parts viz. : calcium and phosphorus :

(i) Correlation between the amount of phosphorus applied and (1) the increased yield of crops, (2) phosphorus content of clover.

Andrew C. S. observed that "the phosphorus contentof clover increased from 0.12 per cent to 0.28 per cent with the increasing amount of phosphorus and was closely correlated with yield, (r–0.88 P–0.01) as shown per table below."

TABLE I

Treatment Equi-superphosphate Cwt/Acre	Yield dry matter basis. Cwt/Acre	Phosphorus (% dry weight)
2	18.8	0.15
3	26,6	0.15
4	28.6	0.20
4.5	32.7	0.23
6	31.5	0.25
10	29.4	0.30

The above table gives clear cut idea about this high correlation.

(ii) Correlation between the amount of calcium applied and (1) the increased yield of crop, (2) calcium content of clover.

Andrew C. S. has also observed the response of added calcium as shown in Table II below :

TABLE II

CaCo3 g/pot	Treatment equiva. CaCo3 Cwt/acre	Chemical Composition on dry matter basis. Yield g/pot	Ca % in the clover crop
Nil	Nil	1.4	0.60
0 32	2	6.4	0.92
0.64	4	7.3	1.21
0.96	6	8.6	1.29
1.28	8	9.0	1,83
3,20	20	7.9	1.76

He interpreted the results as under:-

"The greatest clover yield was obtained

from plots receiving 1.28 gr. calcium carbonate per pot (equivalent to 8 0 cwt/acre). The calcium content of the clover was increased by the addition of calcium to the soil, the content varying from 0.6 to 1.83 per cent calcium and these values were closely related with the yield of dry matter (r=0.81 0.01)" Vide graph on the opposite page.

(iii) Relation between yield and nitrogen percentage following application of calcium phosphate.

Experiments conducted at Rothamsted showed both yield and nitrogen content of the hay were increased as also were its lime and phosphate content. The results of application of calcium phosphate in increasing the yield obtained from a single dressing applied in winter of 1930–31 as well as nitrogen content of hay are shown in the following Table III.

TABLE III

Yield of dry hay cwt/acre	Nitrogen % of dry hay
24.3	1.32
29.5	1.36
33.6	1.55
36.4	1.58
37.8	1.59

(iv) **Relation between increase in percentage nitrogen and starch equivalents per 100 lbs of the crop.**

For each lb. of nitrogen taken up by the plant, approximately 6.25 lbs. of proteins are formed into the tissues of the plants. During the process of growth of plants, as a rule, as nitrogen content of a plant increases, the fibre content goes down. Further there exists a straight line negative correlation between the fibre content and the digestibility of a crop when used as food, as well as its net energy value obtainable by the animals consuming the food. Thus for every 0.1 per cent increase in nitrogen content of the crop about 2 to 3 lbs. of starch equivalent per 100 lbs. of the crop increased.

Inference from the data of correlations:

5. The above data of correlations show that by application of superphosphate to a crop the following beneficial results are obtained viz :

(1) Yield of crop is stepped up.

(2) Percentages of calcium, phosphorus and protein of forage increase. In the case of grain crops and other crops taken for seeds most of the calcium and phosphorus are diverted to seeds which become richer in the above constituents. Contents of vitamins too are upgraded. This means the general increase in the protective or health promoting value of food derived from plants and their products.

(3) Definite improvement takes place in the digestibility of the crop when used as food. Not only does the crop fertilised by superphosphate possess high net energy or calorific value per 100 lbs. but due to increase in yield, the total quantity of starch equivalents obtainable from the crop per acre is also increased. In short, the crops when fertilised with superphosphate become more nutritious and wholesome, yield more calories and at the same time increase the nitrogen content of the soil which in this way is converted into nature's factory of nitrogen fixation, a commodity gained

free of cost delivered and spread right into the cultivator's fields. In our attempts to step up the level of food production quantitatively as as well as qualitatively it is a matter of paramount importance that every acre of cultivated land should be fertilised by superphosphate.

How to make Superphosphate most effective :

6. To obtain best results from the application of superphosphate, the following procedure should be observed, viz :

(a) Superphosphate should be applied as a fertiliser at or about the time of sowing or planting of crops when the root development and prolification activities are at their best.

(b) Placement of superphosphate should be so arranged that most of it falls within the feeding zone of the roots.

(c) Superphosphate applied in Super-Compost form gives best results. For this purpose superphosphate should be thoroughly mixed with compost evenly in all layers so that it gets protection against permanent reversion to insoluble form.

(d) Good aeration of soil not only helps better absorption of phosphorus and calcium by plants but it also helps better fixation of atmospheric nitrogen. For this reason the soil should be well worked to good tilth by preparatory tillage and this tilth should be maintained by interculturing operations.

Plant Regulators In Agriculture

By : M. M. P. Shrivastva and N. P. Sinha

Early history:

The famous German Botanist Julius Sachs (1880, 1882, 1893) decided that the differentiation of roots and flowers was due to minute amount of chemicals moving upward and downward through the plant. In fact, he assumed the existence of definite root-forming and flower-forming substances. A Dutch scientist, M. W. Beijerinck (1888-1897), from his work with plant galls, gave a name to the minute quantities of galls-forming materials given off by gall-producing insects, calling them 'growth enzymes.'

However, it is the name of Charles Darwin which is most commonly associated with the early concepts of growth regulators fn plants. Darwin wondered why plants turned towards light. In a primitive dark room he germinated grass seed and exposed the coleoptile to a light coming from one direction. The coleoptile bent towards the light. But when he covered the tip with tin foil. or cut it off, so that it was not acted upon by light, even though the region directly below was exposed to light the coleoptile did not bend. On the other hand, if he placed the tin foil around the base of the coleoptile and exposed the tip to light, there was bending towards the light. From this he concluded that something was transmitted from the upper to the lower part which induced bending.

Definition :

The word "hormone" is derived from The Greek work "I arouse to activity". It was suggested by Hardy, and first used by Starling in 1906.

A plant hormone is an organic compound which regulates the physiological processes of plant regardless of whether these compounds are naturally occuring or synthetic, stimulatory inhibitory, local activators or substances which act at a distance from the place where they are produced.

Hormones in plants :

In 1909, a German Scientist, Hans Fitting, working in Java, had found that a water extract of orchid pollen when applied to an orchid flower would cause the petals to fall and the ovary to swell, just as would the pollen itself. Also, from 1910 to 1913, P. Boysen Jensen, in the laboratories of W. Pfeffer in Germany, discovered that, if the tip of an oat seedling coleoptile was cut off and then replaced, but with a thin coating of gelatin between the cut sections, the stimulus from the tip would pass through the gelatin and cause a curvature of the coleoptile.

Great interest had by now been aroused in the general problem of Wuchsstoff (translated : "growth substance"). In the laboratories of W. Pfeffer in Germany and F.A.I.C. Went at Utrecht, Holland, there was much activity. Between 1914 and 1919, A. Paal discovered that, if he cut off the tip of the coleoptile of an oat seedling and applied it against the side of the cut stump, the coleoptile was induced to grow on that side and so to bend away from the tip. He concluded that the curvature was due to an unequal distribution of a growth regulating substance. His statement made in 1919 is still useful, "The tip is the seat of a growth-regulating centre. In it a substance (or a mixture) is formed and internally secreted, and this substance, equally distributed over all sides, moves downwards through the living tissue. In the growing zone it causes symmetrical growth. If the movement of this correlation carrier is disturbed on one side, a growth decrease on that side results, giving rise to a curvature of the organ." The next important step was made in 1926 by F. W. Went who showed clearly that a substance was produced in the tip of the coleoptile which could be extracted, and which would cause curvature in a coleoptile to which it was applied.

Practical applications:

It was not long until the new ideas of growth regulators were applied to practical problems. In fact, within a year of the identification of indoleacetic acid by Kogl, Haagen-Smit and Erxlebew (1933) it was shown by Went and his associates and later by Zimmerman and Hitch Cock that when this chemical was sprayed onto plants, roots might form on stems and even fruits. Immediately 3-indoleacetic acid was employed in plant propagation to aid in the rooting of cuttings and other plant parts. However, it is of interest to recall that Sachs has suggestd as early as 1880 that there was a root-forming substance present in plants and that Beijerinck (1888-1897) had shown that the presence of leaves stimulated root formation. Still more recently (1925) Van der Lek had found that strongly sprounting shoots were favourably disposed to root development. All this was now explained on the basis of

the manufacture of indoleacetic acid in actively growing parts of the plant and in leaves.

Interest was further aroused in the possibility that other chemicals might induce rooting. Hurriedly, thousands of known chemicals were tested for activity, and chemists synthesized new compounds for trial. Some measure of the great interest in this field is shown by the fact that between 1934 and 1937 nearly 5,000 articles were published dealing with growth regulators. New discoveries and new applications followed rapidly. Among the more important of these, in addition to the rooting of cuttings, were the prevention of preharvest drop of fruits, increase in fruit set, production of seedless fruits, prolongation of dormancy in nursery stock, delay in blossoming of fruit trees, improvement in regulation of flowering in pineapple, defoliation, thinning of fruit, hastening of fruit maturity, hastening the colouring of fruit, reducing water loss in fresh vegetables, ripening fruit artificially and destruction of weeds and undesired woody plants.

Common Abbreviations:

CIPC	O-Isopropyl-N-(3-Chlorophenyl) Carbamate
CIBA	para-chlorophenoxyacetic acid
CIPP	alpha – ortho-chlorophenoxy propionic acid
CMU	3-para-chlorophenyl-1, 1-dimethyl urea
DCU	Dichloral urea
DNOC	2,4-Dinitro-ortho-cresol
DNOCHP	Dinitro-ortho-cyclohexyl phenol
DNOSAP	Dinitro-ortho-secondary amyl phenol
DNOSBP	Dinitro-ortho-secondary butyl phenol
EH-1	2, 4-Dichlorophenoxyethyl sulphate
IAA	beta-Indoleacetic acid
IAD	beta-Indoleacetamide
IBA	beta-Indolebutyric acid
INBA	2-Indo-3-nitrobenzoic acid
IPA	beta-Indolepropionic acid
IPC	O-Isopropyl-N-phenyl carbamate
MCPA	2-Methyl-4-chlorophenoxyacetic acid
MENA	Methyl ester of naphthaleneacetic acid
MH	1,2-Dihydro-3,6 – phridazinedione (Maleic hydrazide)
NAA	alpha-Naphthaleneacetic acid
NAD	alpha-Naphthaleneacetamide
NB	alpha-Naphthalene butyric acid
NOA	Beta-Naphthoxyacetic acid
PA	Phenylacetic acid
PB	Phenyl butyric acid
PCP	Pentachlorophenol
PE-TCA	Phenoxyethyl trichloroacetate
PMA	Phenyl mercuric acetate
TCA	Trichloroacetic acid
TIBA	2,4,5-Triodobenzoic acid
2,4-D	2,4-Dichlorophenoxyacetic acid
2,4 5-T	2,4,5-Trichlorophenoxyacetic acid

2,4,5-TP 2,4,5-Trichlorophenoxypropionic acid

Methods of Application:

At the present time only three methods of application have come into widespread practical use. Virtually all the preparations commercially available today are applied in one of the three following ways:

1. Application of power mixtures to the base of cuttings

2. Quick dipping of the bases in concentrated solutions

3. Prolonged soaking of the bases in dilute acqueous solutions.

Each of these methods has certain advantages and disadvantages. Since numerous variables often enter into the treatments, there have naturally been some differences of opinion among experimenters regarding relative merits. Apparently no single mode of application has a clear superiority over others in all respects. Some plants respond better to one method than another.

Conclusion :

Growth-promoting substances on the one hand and growth-inhibiting chemicals on the other, offer intriguing possibilities for controlling flowering in economic crops. With proper timing and with the proper dosage, flowering, fruiting and seed production may be accelerated. in some instances flowering may be chemically induced. Conversely, by altering the time of application with respect to the development of a particular plant and changing the concentration of a given chemical, reproduction may be inhibited or prevented in those crops induced by environmental factors to become reproductive when it is desirable that they remain vegetative.

Fruit setting chemicals may be used as aids in plant breeding. Many varieties of plants are incapable of setting seed or fruit even though the flowers are pollinated. The use of growth regulators has increased both the number of successful crosses and the number of seeds per cross and has assisted in overcoming certain incompatabilities.

Collective Farming

By : Ramesh Chandra Agrawal

Definition :

FARMING. is classified into various categories according to the system of their operatorship and the type of their ownership e. g. State Farming, Peasant Farming, Capitalist Farming, Co-operative Farming, Collective Farming, etc. In the collective system of farming, all the factors of production are socialised. The land belongs to the State and is given to the collective farms for free use. The other resources of the farm such as livestock, implements and machinery, seed, manures and fertilisers, fodder farm buildings, etc. all belong to the farm itself. But it does not mean that the member of a collective farm cannot or does not have any property of

his own on the collective farm. He is given a house and some adjoining land for his personal use on which he can grow vegetables, plant a few trees or put it to similar other uses. He can keep his own poultry, a few milch animals and rear silk worms all of which form a source of extra income to him.

Brief History :

The collective system of farming owes its origin to U.S.S.R., where it was started in 1929. The idea was conceived by Lenin and his foilowers. The condition of agriculture in the Soviet Union was very deplorable before the Great October Revolution. Even immediately after the Revolution, cultivation was done on small holdings with indigenous implements and meagre resources. The scale of production was small and agiculture was a deficit industry. It needed reorganisation and development because for the development of the country, the development of agriculture was indispensable. Without agrarian reforms, the rapid expansion of other industries was impossible.

The first step taken in this direction was the abolition of landlordism and recognition of the rights of ownership in land of only those who actually tilled it. Co-operative societies for purposes of production, consumption and marketing of agricultural produce were organised throughout the Soviet Union. These co-operatives undertook the difficult task of reclaiming new areas of land and bringing them under the plough, cultivating the land jointly with the help of machines owned by themselves and increasing irrigation facilities. The members of the producers' co-operatives (communes) held all the means in common and were maintained by the communes. All the members shared the income of the commune equally. These co-operatives paved the way for the establishment of collective farms of to-day-the Kolkhozes. By 1937, nearly 93% of the peasant house-holds had joined collective farms. According to Mr. Voitsekovsky, there were about 70,000 collective farms in the U.S.S.R., each having on an average about 2,000 hectares (1 hectare = 2.471 acres) of land under cultivation in 1957.

Membership :

Everyone is eligible for membership. To become a member of a collective farm one has to pay the prescribed admission fee in cash (usually 20 - 40 rubles) and contribute (in instalments) land, livestock, implements, machinery, etc., as one's share to the collective farm. As stated earlier, he is allowed to have some private property. Under the Model Rules of the Agricultural Co-operative adopted by the Second U. S. S. R. Congress of Collective Farm Shock Workers in 1935, "Each collective farmer's household in the agricultural region receives for its personal use free of charge a land allotment ranging from .25 to 1 hectare (not counting the house site); the collective farmer may keep a cow, upto two calves, 1 - 2 sows with litters, upto 10 sheep and goats, unlimited amount of poultry and rabbits and upto 20 beehives.

A member is free to quit collective farm, if he so desires. However the land contributed by him to the collective farm will not be returned to him. Instead, he wil be paid cash equivalent of the value of his share.

Resources :

All the factors of production in a collective farm are socialised and do not

belong to any individual. The members themselves work on the farm and supply labour needed for its operation and running. The rest of the factors either belong to the State or to the Collective Farm.

i) **Land :** The land belongs to the State and in U.S.S.R., it has been given to the collective farms for free use in perpetuity. According to the provisions made in Article 8 of the constitution of the U.S.S.R., "The land cultivated by collective farmers is secured to them for their use free of charge and for an unlimited time".

ii) **Equipment and Machinery:** In the beginning the collective farms lacked both, the money for purchasing the costly machinery and technical, trained personnel to handle and operate them properly. The Government came to their rescue by setting up Machine and Tractor Stations (popularly known as M.T.S.). These stations were equipped with tractors and other modern agricultural equipment and machinery. They were also provided with workshop facilities for repairs, etc. The M.T.S. provided the members not only with the machines for cultivation but also experts in different aspects of agriculture to advise and help them. In addition, they trained the members of the collective farms in different technical jobs for running their farms on scientific lines. All the Machine and Tractor Stations possessed considerable stock of machinery. These machines have become the property of the farms after the reorganisation of M.T.S. which have now been converted into repair and technical service stations.

Organisation And Management:

Administration : The Collective Farm Board is responsible for the organisation and day to day running of the farm. It is a body of persons elected by the General Body of the members for period of two years and is headed by a Chairman. It meets usually twice a month, draws out the plan of work and allots the same to different 'Brigades'. The General Body is the final authority for all the important matters of the farm such as framing rules and regulations; electing the Collective Farm Board and its Chairman: taking decisions regarding the annual programme of production, settling the rates of remuneration for different types of farmwork and determining the manner of distribution of profits. The General Body ordinarily meets three to four times a year.

ii) Management of Labour : The whole of the labour is divided into different 'Brigades' according to the nature of the work and the skill and the ability of the members to perform it. For example, one brigade may be entrusted with the job of operating the machines, the second may be made responsible for its maintenance and repair, the third may look after the livestock, the fourth may construct and maintain farm buildings, the job of the fifth may be fruit-growing and so on. Each brigade is under the charge of a 'Brigade-leader' who is responsible for the proper and efficient working of his brigade. The brigade-leader is an experienced, efficient and respectable member of the collective farm and is elected by the General Body. If the work of the brigade is of a superior quality, bonus is given to the members of the brigade in addition to the usual wages. As such every member tries to do his best because the slackness or inefficiency on the part of even one member will result in a financial loss and would bring bad name to the

whole brigade. Moreover, no leader wants to keep such a man in his brigade who is illreputed or is inefficient. A brigade is further split into teams of 7 – 12 members. Such an arrangement has been found to be helpful for judicious, effective and efficient use of labour.

The wages are paid according to the quality and quantity of work (expressed in terms of work-day units) done by a member on the farm. Standard quotas of work for a collective farm are fixed by its General Body for the jobs of different nature. For example, one day's work of an ordinary labourer may be equal to 1.0 workday unit. that of a mechanic to 1.5 workday units, that of a tractor driver equal to 2.0 work-day units, that of a manager equal to 5.0 workday units and so on. The standard quota set for different types of work varies farm to farm depending on various factors.

In the end all the workday units credited to members totalled up separately for each member and wages are paid according to the total number of workday units earned by each. In this way a more efficient member is able to earn more than a member with lesser efficiency. Special awards are also given for the work of outstanding calibre.

In addition, there is an auditing committee on each farm. It is selected by the General Body to supervise the activities of the Board and check its accounts.

Distribution of Profits :

A part of the produce is given to the State on the basis of a predetermined quota fixed by the State. Some part is paid to the Machine and Tractor Station for the machinery and other services rendered to the collective farm. In accordence with the decisions of the General Body of the collective farm, some part of the output is put into the reserve fund, a part is set aside for emergency purposes and for helping orphans disabled or old members and the remainder is distributed to the members according to the wages earned by them. In this way the members are encouraged to do more and better work.

Collective Farming In Israel :

In addition to U.S.S.R., there are several other countries following collective system of farming. Israel is one of them. The collective farms in Israel are of various kinds the most common being 'Kibbutz'. In this system, there is a high degree of collectivisation. All the land and other factors of production belonging to the whole village or group and every adult inhabitant of the village is a member of the farm, (Whether he be a doctor, cultivator, teacher or a manager). Everyone works according to his capacity and is paid according to his needs. The income of every member is pooled into a common fund and all the requirements of all the members e. g. boarding, lodging, clothing, education of the children, medical aid etc., are met from this fund. The kitchen is common and plays a very important part in the organisation and running of the farm. It is a sort of meeting place for all the members who assemble there in the evening for common meals. Important issues are discussed and the allotment of the work is also done at this time. All the members are informed of the nature and details of the work that they have to perform the following day and relevant instructions are given in this connection. All the material and equipment required for the job is kept ready on

the spot and the member has not to waste his time in procuring it.

Achievements In U. S. S R.

The collective system of farming is said to have revolutionised the whole of agricultural economy in the U. S. S. R. There has been a rapid increase in the agricultural production and the standard of living of the cultivators has risen quickly. The cost of production of agriculture produce has gone down and the efficiency of labour is said to have increased four times that of pre-revolutionary era. The area sown in the U. S. S. R. in 1958 increased by nearly 191 million acres. According to Mr. Voitsekhovsky, "In 1958 the marketable output increased as follows compared with 1913: grain and milk three times; wool nearly four times; sugarbeet nearly five times; cotton, sunflower seeds and vegetables nearly six times; meat and potatoes twice over. The average income of peasants in money and kind (taking into account free education and medical services, pensions allowances and other benefits at the expense of the State) rose approximately six fold during this period".

Conclusion – Possibilities In India:

No doubt, collective system of farming has achieved tremendous success in U.S.S.R., Israel and some other countries of the world. However, the possibilities of its adoption, presently in India, appear remote. The reasons are not far to seek.

1. In this system of farming the land belongs to the State. The peasant of this country is deeply attached to his land. In many cases, the land is the measuring rod of his prestige in the society. Moreover, his mentality is such that he wants to cultivate his land individually. He is even reluctant to pool his land in a co-operative farm for joint cultivation. He is very conservative and does not like the change. He feels that by becoming a member of the collective farm, he would loose his freedom and right of ownership of land and thus get reduced to the status of a mere landless labourer.

2. A good portion of the land is owned by big landlords who get their fields cultivated by hired labourers or on share basis, and do not work with their own hands. In many cases they are absentee landlords. On a collective farm everyone has to contribute his labour. These landlords would never like this system of farming to be adopted in this country as not only they would cease to be the owners of big holdings but would also have to work with their own hands.

3. In India, a greater part of the agricultural labour comes from depressed classes. The people of higher castes think it below their dignity to do the farmwork with their own hands. For example, in certain parts of the country, the Brahmins do not plough the land. If some one in their community does it, he is ex-communicated. There is no scope for such persons as on a collective farm, one who does more and better work is better off.

4. One of the strong points of collective farms in Russia and Israel is their extensive mechanisation. In our country, for various reasons, the conditions are not favourable for a change over from cattle power to mechanical power. The cultivators, in general, are illiterate and ignorant. The lack of machines suited to our requirements, and sufficient and cheap fuel. insufficient repair facilities and shortage of technical trained personnel to operate them

are some other difficulties. However, they might be overcome in the long run. But the real stumbling block in its adoption is the fear of displacement of human labour and draught cattle. A large portion of persons employed in agriculture will be thrown out of employment with the increased use of machinery on the farms. Alternative employment has to be provided to the labour so displaced. The problem of unemployment and underemployment among the farm labour is already very acute in India.

5. It has also been remarked that government pressure has in no way contributed insignificantly to the success of the collective system of farming, which does not appear to be conducive to the conditions prevailing in India.

Whatever be the truth, no one can deny the astounding achievements of the Soviet Union in the field of agriculture and allied industries through the system of collective farming.

Collective farming has not been given a practical trial in this country so far. It is suggested that a few pilot projects on collective farming may be started in this country to asses the suitability of this system in India under the present circumstances.

Fruits And Vegetables Preservation Industry In India

By : S. D. Magun (U. S. A.)

THE Fruits and Vegetables Industry is still in its nascent stage. It started its career on modern scale during the World War II. The industry is important not only from the point of view of food to people who are under-nourished but also for agriculture itself. It will develop it by encouraging horticulture in farming. It is a cottage and small scale industry which can be started by the producer himself at his farm and he can earn a supplementary income by operating on it. It will also lighten the burden of population on land by absorbing a surplus labour in agriculture. Moreover, the industry can be a source of foreign exchange earning.

During the world war II, when, due to lack of shipplng pace, imports became difficult, the canned fruits almost disappeared from Indian market. These conditions gave production to the industry and many Indian firms stepped into the production of preserved fruits and vegetables. A good number of factories grew up in centers such as Mathura, Lucknow, Allahabad and Delhi. This lead was taken up on a large scale commercial basis in Bombay, Calcutta, Amritsar, Nagpur and Bangalore.

Realising its importance as an earner of foreign exchange in these hard days, the Government of India took direct interest in its development. It promulgated the Fruit Product Control order under the Essential Commodities Act in order to prevent deterioration of quality in canned products. It was some sort of legal quality control on the industry. Under the order, no one could market or manufacture

canned fruits without a proper licence from the Central Government. The granting of license is conditional on the fulfilment of a number of minimum standards in addition to proper processing, packing, marketing and labelling of products. This type of quality control is also prevelent in the United States. All the canned products are properly packed and sealed and they are of so high quality that people like them more than fresh fruits and vegetables. Moreover, they are relatively cheap. Here, the industry is being run on a large scale and is one of the important consumption goods industries of the country. The main factor which enabled it to produce on this scale is the introduction of refrigeration in its processing and distribution.

Enforcing Hygienic Standards :

The specifications as envisaged in the quality control put the Indian product on a level with those imported from other foreign countries. The government also maintains a strict check over the hygienic manufacture of fruit products in all the factories by employing a regular inspection staff. Besides, samples of the products offered for sale by various plants are periodically examined by the central Food Technological institute at Mysore.

As a result of these measures, fruit preservation is showing signs of soon becoming "Big Business". The Government has, therefore, allotted a sum of Rs. 10.5 million under the Second Plan for development of horticultural schemes, for cultivation of more fruits and vegetables on an all-India basis. A number of factories plan-period. A subsidized plant to make tin plates for canning will also be installed so as to help the industry make its own packing arrangements.

At present, the industry's annual production stands at 20,000 tons. This is the combined turnover of some 750 licensed manufacturers, the majority of whom are operators on very small scale, i. e. on cottage level, feeding mainly local demands. A few large factories employ 50 to 60 workers, half of whom are women. Washing, peeling etc., of fruits are all done by women, while men look after subsequent processes – syruping, sealing of cans, etc – in addition to taking care of boilers and other connected machinery.

The estimated value of total production is some where near Rs. 20 million. Nearly 80 per cent of the total is consumed in India itself and only 1,278 tons of preserved fruits and vegetables were exported in 1956. The major countries buying these indian product are U, K., U. S. A, South East and West Asian Countries. The value of exported tonnage was Rs. 2.25 million in 1956.

I feel that there is large scope of exporting Indian Chutney to U. S. A. The Americans have great liking for Chutney from mangoes which is scarcely produced in the country. I am noting a marked taste for Indian mango Chutney. If India tries to tap this market, it can, undoubtedly, contribute to its Dollars reserve, which is already running short. Moreover, the industry can develop its market in Western Asia where no fruit except date is produced. The United States is exporting a large amount of canned products to Soudi Arabia, Lebanon, Israel etc. India can easily compete with this country favourably in this market by producing goods cheaper which is quite

possible because of its variety of climate and cheap labour.

The main items of manufacture are a variety of squashes, jams, pickles and Chutneys. Chief among the preserved fruits and vegetables are oranges, limes, mangoes, pine apples, guavas, apples, peas, etc. The squashes are consumed by India's soft drinks industry previously dependent on Australian imports.

Vegetable Growing

By: H. M. Desai

(Continued From April 1960 Issue)

XIII. CULTIVATION OF CROPS.

THESE will be discussed in groups and only special features of each will be given.

I. The Perennials:

A. Little gourd. (Coocinia indica. Wand A) (M. Tondli G. Ghiloda K. Tondalikai).

It is a common wild creeper growing on bushes and in hedges. In wild state the fruits are bitter in taste. The cultivation of the crop is now widely spread for the domestic use. As a plantation crop the area under this crop is limited. It is mostly grown in Kolaba district and to a limited extent in the Thana and Surat districts.

For this crop any type of soil or climate will suit. Soil should be well drained.

As the crop is to stand a number of years in one place after planting, the land should be well prepared by ploughing, harrowing and levelling in the beginning of the hot season. Basins should be prepared 8' x 8' or 10' x 10' feet apart. If possible these should be burnt to destroy pests that may be harbouring in the soil. These basins then should be manured at the rate of 20 to 30 cartloads of farm yard manure or well rotted compost which should be well mixed with soil.

If irrigation facility is available, cuttings from over one year old vines well developed (not slender, nor too thick) 8 to 12 inches long with four buds are selected for planting. At the time of planting two buds are pressed in the soil and upper two ones at each end of a vine set is kept exposed. In each basin three cuttings are planted before start of cold weather and basins are irrigated. Subsequent irrigations are given as and when required till regular monsoon conditions are established. If this is not possible planting may be started in the monsoon season. In about two weeks' time sprouting will start.

Plants need support and vines should be trailed on a mandap of convenient height.

Aftercare consists of timely irrigation, cleaning of basins, trailing of vines etc. Top dressing of oil cake is given in the first year in the month of August, and in the beginning of cold weather at the rate of 20 lbs. N each time.

In the subsequent years in the hot weather when yield decreases the vines are pruned, basins are dug and plants are given rest. Before monsoon farm yard manure is given at the rate of 20 cartloads of manure and basins filled up and irrigation started. Top dressing of cakes is given as indicated above, twice.

The crop gives fruit for the whole year but monsoon pickings are heavy. Picking is done twice a week. In all 8,000 to

10,000 lbs. of yield is obtained. If well cared for, the plantation lasts for 6 to 8 years, or else it is changed every third or fourth year. There are two distinct varieties as could be seen from the shape of fruits. One is plump short and the other one is long and tender. No selection work is done to segregate these varieties in order to have the one yielding, higher yield of better quality.

PARWAR (Trichosanthes dioica, Roxb) : This was a speciality of betel leaf gardens of Baroda. The crop was grown on a plantation scale outside the garden first at Kathor village in the Surat District. From this village it has spread in other parts of district the Surat and all over Gujarat.

The great peculiarity of this crop is that among female plants some male plants are necessary for fruit production. One male plant for every 4 to 6 female plants will suffice. This crop yields heavy in monsoon season and fruits are valued as a nutritive vegetable. When the yield diminishes in the cold weather, the plants are given rest. In February/March basins are manured at the rate of 20 cart loads of F.Y.M. per acre and irrigation is started. Plants sprout and these are trailed on the mandap. In the monsoon a top dressing of cake manure is given at the rate of 400 lbs. to 600 lbs. per acre. If well treated, the yield will come to about 4,000 to 6,000 lbs per acre. The plantation should be changed every third year.

(The general routine of cultivation is as for Tondli)

Kartoli (Momordica dioica Roxb): Kartoli is a perenniel climber with tuberous roots, growing wild. The fruit is one to three inches long shortly beaked and densely covered with spikes.

In cultivated fields this crop grows in grazing area and in the hedges. This crop requires a systematic study, for selecting the best variety as a cultivated crop.

Chavchav (Sachium Edule) : A vegetable fruit resembling guava and in taste it is like dudhi. It is a recently introduced vegetable and is grown on a small scale in Poona. The fruit keeps long without spoiling,

This crop is propagated either by vine cuttings or by root cuttings or by seed in fruit.

No further details are available as the crop is not grown on a field scale. Its cultivation, however, needs expansion.

Alu (Colocasia Antiuorum, Schott): This is a leafy vegetable usually grown in marshy places mostly in the back yard of houses. This crop grows very well under heavy sewage irrigation. Near big vegetable centres this crop is grown as field crop under profuse irrigation.

The crop is propagated by rhizome sets and in about four months after planting. Marketable leaves are gathered every three or four days. Rhizomes are also used as vegetable. There are many varieties but the cultivation of *Bada Banda* variety is considered suitable. The sets are planted in beds, one foot apart. The care consists in irrigation, weeding and cleaning. The beds should be manured every two or three months with well rotted farm yard manure or compost.

Leaves should be harvested as they attain marketable size. Care should be taken always to keep a few leaves on a plant as in the absence of leaves plant growth would stop. Plantation for leaf harvest will be required to be changed every two years.

Drum Stick : (Moringa pterigosperma)

Locally known as Shevga, this tree is found growing in gardens house compounds and fields all over the peninsula. Flowers and leaves are used as greens and tender pods as a vegetable.

Agasta : (Sesbania grandiflora) is a tree growing in fields and gardens the flowers of which are used as vegetables.

Banana : (Musa paredisiaca) flowers and tender unripe fruits are used as vegetables.

Papaya : (Carica papaya, L) young unripe fruits are used as a vegetable.

2. Annuals

Crops that have seasonal and yearly life are called annuals. Most of the vegetables are included in this group.

Leafy Vegetables

From nutritional point of view, these vegetables are considred very important and experts recommend that, these should invariably be used in diet every day.

These vegetables are propagted by broad casting seeds in beds. Being succulant require irrigation in small doses but frequently. They occuppy land only for few weeks to few months and are harvested in small quantities daily as per the market need. After harvesting these are tied into bundles and are marketed in baskets on head loads to preserve its quality.

The important cultivated crops of this group are as under :

Ambadi : (Hibiscus cannabinus. L) Cultivated any time of the year in about six weeks after planting tender leaves are produced in abundance. These are plucked, tied into bundles and sold as vegetable.

Chakwat : (Chenopodium album. L) After 4 to 6 weeks sowing leaves are harvested for vegetables.

Chandanbatwa : (A triplex hortensis. L) Grown as vegetable through-out the year. Harvested for vegetables after 4 to 6 weeks after sowing seeds.

Chavlai : (Amaranthus polygamous, L) Grown any time of the year. Green plants used as vegetables when about 4 to 6 weeks old.

Fenugreek : (Trigonella Foenum) Popularly known as methi. This crop is grown any time of the year for vegetables and for seed purposes it is grown in the winter season. This crop is grown very widely on field scale in small area at a time. Harvested from tender stage to the flowering stage. On a field scale seed rate is 40 lbs. and yield 6,000 to 8,000 lbs. per acre. Methi seeds are used for spicing food preparations.

Ghol : (Portulaca oleracea, L) Suitable for cultivation all the year round. Mostly found as weeds in the garden areas. Leaves used as vegetables. Taste is sour and is popular as a vegetable.

Lettuce (Lactuca sativa, L) is a crop of cabbage family and is usually grown in in a cabbage crop as a mixture. It is very early and its life cycle is finished before the cabbage crop develops. Leaves are used both as vegetables and as a salad.

Math : (Amaranthus tricolor, L) can be grown any time of the year. Tender shoots and leaves are used as vegetables. Of this there are two varities the red and the green one. Both are used as vegetables.

Mint is a spica crop. Leaves of which are used for spicing food preparations. If well cared for, the plants continue giving leaves for a very long time.

Mustard : (Brassica juncea, Coss) is a cold weather crop and is grown as a mixture crop with rainfed as well as garden crops. Leaves and green pods used as vegetables.

(Contd. in next issue)

Third Five Year plan And Self Sustained Growth

(Contd. from page 328)

According to Rostow, U.S.A. is currently passing through this stage.

Pre Conditions of Self-Sustained Growth :

The "Take off" stage or self-sustained growth does not just dawn upon a nation. There are certain pre conditions which are necessary for hastening the economy towards this stage.

A rise in the rate of productive investment is the first pre condition necessary for takeoff. A 5 % rate of investment in an economy where capital output ratio is 3:1 and population increases at a rate of 1.5% per annum, increases the per capita output just sufficient to meet the demands of the increasing population.

Without a sizable manufacturing sector in the economy, it may not be possible to attain sustained economic growth. The existence of a manufacturing sector as a pre condition ensures the presence of technical personnel, capable of adopting and assimilating new strides in science.

Another pre condition relates to the existence of a "political, social and institutional frame work" capable of canalising domestic sources of supply for development.

It is necessary to have in the community a go ahead group of people who have the capacity to take risks. At various times in the history of advanced countries, certain groups of people have risen to new heights in raising new industries. The sense of achievement rather than profit motive, is a sufficient stimulus for them.

The manner in which Savings in the community are accelerated is a pre condition for take off. A regular supply of investible funds must be ensured for self-sustaining growth.

Third Five Year Plan :

If a country satisfies these pre conditions, it is logical to consider it to have reached the stage of self-sustained growth. We may now examine how far the proposed Third Five Year Plan is going to achieve these pre conditions.

In 1950-51 the rate of productive investment in India was a little above 5% of the national income; with the result, the per capita output in the economy was stagnant. The First Plan was formulated to raise the level of investment from 5 to 7% of the national income. By the end of the second plan it will rise to 11% of the national income. The third Plan aims at raising the level of investment in the economy from 11% to 14% of the national income.

The existence of a large industrial sector as one of the pre conditions for self sustaining growth has been almost satisfied by the end of the Second plan. The aggregate volume of all industrial machinery produced in the country has risen from Rs. 11 crores in 1951 to about Rs. 79 crores in 1958. This is a clear testimoney for the expansion of industrial sector.

The third five year plan has placed special emphasis on heavy industries which will help to make the economy self-sustaining namely steel, heavy chemicals and machine building. A capacity target of 10.2 million tons for steel 1.5 million tons of Pig iron

have been propoed. The Bhilai, Rourkela, and Durgapur Steel plants are proposed to be expanded during the Third Year Plan period.

The structural frame work of the economy has been significantly modified during the course of the First and the Second Plans. The boundaries of the Public sector are being steadily extended. The fiscal policy of the Government has also undergone appreciable changes. Today the government is in a position from which it has got access to all resources of the country.

The enlargement of educational and training facilities that has already taken place during the First and the Second Plan period and which will proceed further during the Third Plan period is expected to yield well trained captains of industry. The annual intake of students in the degree and diploma courses in Engineering institutions, has already increased by four times from 10,000 during the First Plan to 37,500 in the Second Plan. The supply of entrepreneurial talent and managerial ability is also on the increase.

Increase in the volume of savings in the economy was recognised by the planners even during the First Plan period. This is shown by the success achieved for the public borrowing programmes of the Government. During the Third Plan period Savings will be increased from 8% to 11% of the national income. The plan proposes Rs. 850 crores to be obtained from public borrowing and Rs. 550 crores to be obtained from small savings.

Conclusion : We have discussed the theory of economic development put forward by Prof. W. W. Rostow and how it has got a direct bearing on the rapidly developing economy of India. It is needless to say that most of the pre conditions laid down by Prof. Rostow are sought to be achieved by the targets set out for the Third Plan. We will have to watch and see how the targets are going to be fulfilled, before passing a judgement on it. But it can be fairly stated that with the launching of the Third Five Year Plan India will be entering the stage of "take off".

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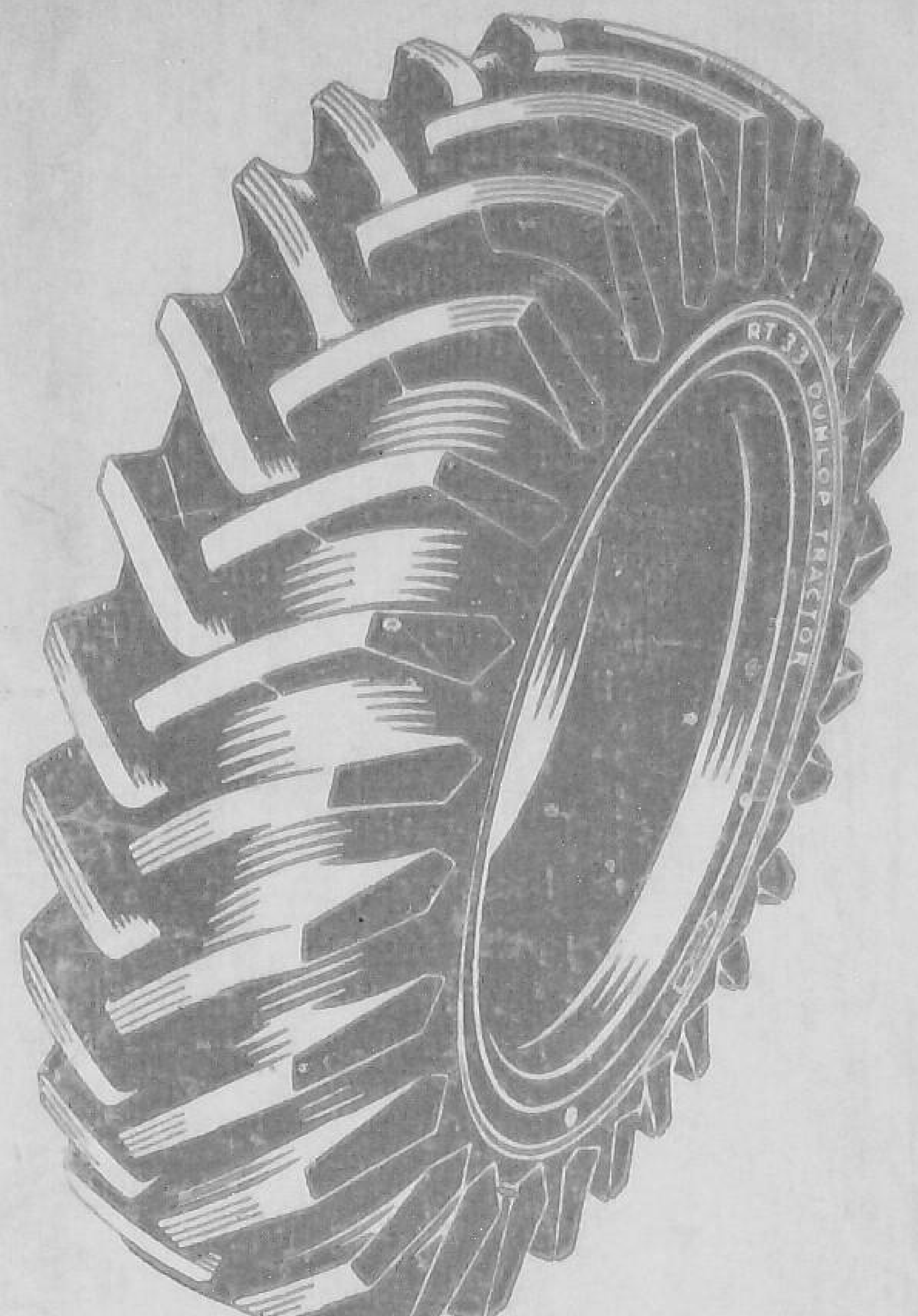

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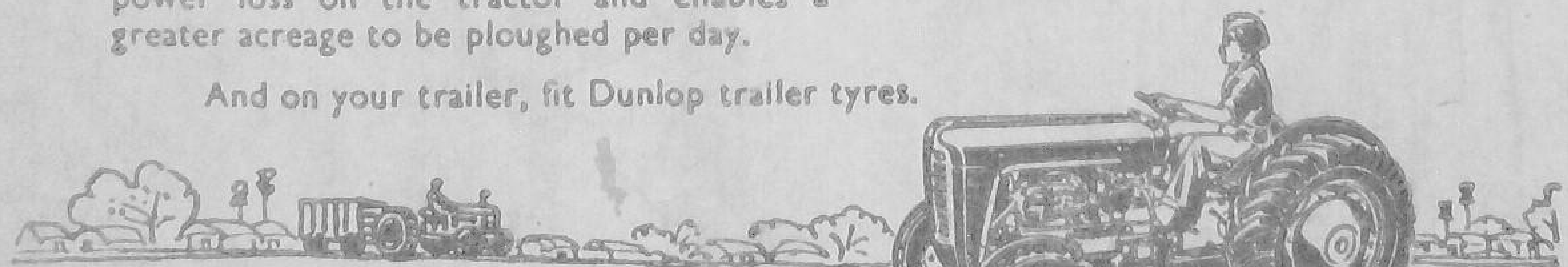

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